barn owls during times of food shortage. However, this behavior usually is difficult to witness. More observations at raptor nest sites are needed to document the fate of nestlings that mysteriously disappear from their nests and to determine how frequent this behavior is and under what circumstances it occurs.

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OSPREYS (*Pandion haliaetus*) SCAVENGING FISH ON ICE

The diet and foraging behavior of ospreys (*Pandion haliaetus*) have been studied extensively in North America (A.C. Bent 1937, *U.S. Nat. Mus. Bull.* 167:352–379; T.C. Dunstan 1974, *Wilson Bull.* 86:74–76; J.E. Swenson 1978, *J. Wildl. Manage.* 42:87–90; A. Poole 1989, Ospreys, Cambridge Univ. Press, Cambridge, U.K.; S.P. Fleming et al. 1992, *Auk* 109:649–654), and other parts of the world (Y.A. Prevost 1982, Ph.D. thesis, Univ. Edinburgh, Scotland; S. Cramp and K.E.L. Simmons 1980, The birds of the western Palearctic, Vol. 2, Oxford Univ. Press, Oxford, U.K.). Live fish, caught by plunging into shallow water, comprised over 99% of the diet in each osprey population studied thus far (Poole 1989). In this paper we provide details of ospreys scavenging dead and dying fish, caught by fishermen, from the ice surface during the first week of nest site occupation in Canada.

Between 1 April and 6 April 1993, two ospreys were noted on artificial nest platforms in the Honey Harbour area of Georgian Bay, Lake Huron (44°51′N, 79°49′W). Ice cover was complete during this period on all water bodies within at least 8 km of these nest sites, and the main melt did not occur until the second week of April. In 1991 and 1992 the first ospreys were noted in this area on 7–8 April, and some of these birds flew up to 12 km to reach open-water fishing areas.

On at least three separate occasions in the 1–6 April period in 1993, the two ospreys were seen by one of us (EC) soaring and hovering above ice-fishing holes in a small bay 2 km from the nest sites. Fishermen were catching large numbers of black crappie (*Pomoxis nigromaculatus*) at this time, and usually left 15–30 cm fish on the surface of the ice. Since many different ice holes were fished by up to 50 people on some days, dead and dying black crappies were sometimes left unattended beside ice holes for up to 30 min. On several occasions both ospreys swooped down to the ice surface about 100 m from the nearest fishermen, and each flew off with a black crappie.

Ospreys have been noted previously to pick up dead or dying fish from the water surface or from shoreline rocks (Bent 1937, Dunstan 1974), but these appear to be the only published accounts of such behavior. We know of no other accounts of ospreys taking fish from the ice surface, but elsewhere in Lake Huron, fledgling ospreys occasionally take fish scraps thrown to them by fishermen (W. Davis pers. comm.). Ospreys regularly use large fish carcasses for nesting material (Bent 1937, Poole 1989), and we have noted this behavior in the Great Lakes. We have also recorded a male osprey picking up and eating a dead largemouth bass (*Micropterus salmoides*) floating at the water surface in Georgian Bay.

Ospreys arriving back at nest sites in northern parts of North America are often confronted with extensive ice coverage of foraging areas during the pre-laying period. These observations of freshly caught fish taken at ice-fishing holes reflect the osprey's adaptability in foraging techniques, and its remarkable tolerance of human presence.

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UNUSUAL PARENTAL BEHAVIORS BY MALE NORTHERN GOSHAWKS

The parental role of male raptors during nesting is typically limited to providing food for their mates and young It is uncommon for male raptors to participate directly in brood rearing, such as brooding or feeding nestlings (L.

Brown 1976, Birds of prey: their biology and ecology, A&W Publ. Inc., New York, NY U.S.A.; I. Newton 1979, Population ecology of raptors, Buteo Books, Vermillion, SD U.S.A.), though it has been documented for some species (L. Brown and D. Amadon 1968, Eagles, hawks and falcons of the world, McGraw-Hill Book Co., New York, NY U.S.A.). The aggressiveness of hungry and physically larger female nestlings may make adult male raptors reluctant to provide care (I. Newton 1978, *J. Zool.* 184:465–487; 1979). This may be especially true among accipiters, a genus possessing strong reversed sexual size dimorphism. P.A. Johnsgard (1990, Hawks, eagles, and falcons of North America, Smithsonian Inst. Press, Washington, DC U.S.A.) postulated that male accipiters never feed their young, but there are conflicting reports. For example, when female sparrowhawks (*Accipiter nisus*) are killed or are absent from the nest, the males will deliver food to the nestlings but will not feed them (D.A. Bannerman 1956, The birds of the British Isles, Vol. 5, Oliver & Boyd, Edinburgh & London U.K.; Newton 1979). N.F.R. Snyder (pers. comm.), however, observed a male Cooper's hawk (*A. cooperii*) that brooded and fed nestlings after the female had been killed. R.S. Palmer (1988, Handbook of North American birds, Vol. 4, Yale Univ. Press, New Haven, CT U.S.A.) reported that female northern goshawks (*A. gentilis*) will not allow males to remain in the nest area after the nestlings are a few days old. Conversely, Bannerman (1956) suggested that male northern goshawks will feed their nestlings but did not provide any supporting evidence.

Here we describe one observation of a male goshawk feeding nestlings and another of a male goshawk brooding nestlings in northern Arizona during the breeding seasons of 1990 and 1991. To our knowledge this is the first documentation of male goshawks providing direct parental care to nestlings while the female was present during all or part of the interaction. The study area and methods are described in C.W. Boal (1993, M.S. thesis, Univ. Arizona, Tucson, AZ U.S.A.).

On 13 July, 1990, at 0735 H, an adult male goshawk delivered a golden-mantled ground squirrel (*Spermophilus lateralis*) to a nest under observation. The nest contained two 30–34-d-old unattended nestlings. The male goshawk stood on the nest rim for a few moments, then fed the nestlings for 8 min. He stopped feeding the nestlings and flew out of view when the female goshawk approached the nest and gave "dismissal" vocalizations (J.H. Schnell 1958, *Condor* 60:377–403) at 0743 H. We detected no differences between the behavior of the male and female goshawks in feeding the nestlings or in the nestlings' responses to being fed by the male or female parent. Neither adult bird was banded, but identification of the sexes was possible by size comparison, plumage characteristics, and the behavior and vocalizations when interacting.

The second observation occurred at a nest where the adult female goshawk was banded but the adult male was not. On 22 June, 1991, the male brought a tassel-eared squirrel (*Sciurus aberti*) to a perch approximately 40 m from the nest tree at 1129 H. The female took the squirrel from the male, brought it to the nest, and began feeding the two 15–17-d-old nestlings. At 1225 H the male goshawk perched in a tree 15 m from the nest tree and made "cluck" vocalizations (Schnell 1958). The female goshawk immediately flew from the nest with the squirrel and began giving "dismissal" vocalizations from an unseen location in the nest stand.

The male goshawk flew to the nest at 1228 H. He walked about the nest and then assumed a brooding position, though he was unable to completely cover the nestlings. The nestlings allowed the male to brood them without displaying any indication of alarm. The female goshawk stopped vocalizing at 1245 H but remained out of view. The male continued to brood the nestlings until 1335 H, at which time he stood, stretched, and flew from the nest.

Nest defense is not the primary role of male goshawks during brood-rearing (Schnell 1958), thus a non-aggressive response to intruders would be expected in contrast to the vocal and aggressive nest defense behavior of female goshawks (Schnell 1958). To observe the males' response to human intruders while brooding, nest observations continued while two field assistants searched the nest area for prey remains and castings between 1300 and 1320 H. Expected behavior of an adult female goshawk at this stage of the nesting cycle would be to leave the nest, perch in a nearby tree while vocalizing, and making low attacking flights at the intruders. The male goshawk, however, showed little concern over the intrusions and remained in a brooding position, even closing both of his eyes for short intervals.

These two incidents were observed during 1539 hr of nest observations. Participation in the feeding and brooding of nestlings by male goshawks is apparently uncommon. However, this report documents that male goshawks can and occasionally do provide direct care to their nestlings.

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